FOREST STATISTICS

FOR SOUTHEASTERN WEST VIRGINIA

Northeastern
Forest Experiment Station
Upper Darby, Pa.
V.L. Harper, Director

FOREST SURVEY RELEASE No. 7

MAY 1949

This is the seventh in a series of Forest Survey statistical releases to be published by the Northeastern Forest Experiment Station. The prior releases in the series are:

No. 1 - Forest Resources of Elk, Forest, McKean, and Warren Counties, Pennsylvania

No. 2 - Forest Statistics for Pendleton, Pocahontas, and Randolph Counties, West Virginia

No. 3 - Forest Statistics for Northern New Hampshire

No. 4 - Forest Statistics for Hancock County, Maine

No. 5 - Forest Statistics for Southern New Hampshire

No. 6 - Forest Statistics for Monongahela Section, West Virginia

FOREWORD

This release contains statistics on forest area and timber volumes in Fayette, Greenbrier, Mercer, Monroe, Nicholas, Raleigh, Summers, and Webster Counties, West Virginia. It includes eight statistical tables on forest area and fifteen tables on timber volumes. These tables are followed by a brief description of Forest Survey procedure and by estimates of the accuracy of forest-area and timber-volume figures. Because many of the terms used in this release have special meanings, an explanation of the terms used may be found at the end of the report.

This report was prepared by the Forest Survey organization at the Northeastern Forest Experiment Station under the direction of Frank A. Ineson, assisted by Harry W. Camp, Jr., in charge of inventory; Roland H. Ferguson, in charge of compilations; and Carl J. Holcomb, field supervisor. Volume table and accuracy analyses were made by C. Allen Bickford. The field inventory in these counties was completed in March 1949. Field work was conducted by Thomas G. Clark, Adrian M. Gilbert, Ted J. Grisez, Alvin K. Wilson, and Robert D. Wray of the Forest Survey. They were assisted by Robert C. Kletzly, Carroll M. Smithson, Hans G. Uhlig, and H. Lee Wilson of the West Virginia Conservation Commission.

This is the third in a series of similar reports that are planned for other county groups within West Virginia. After survey findings for all the counties in the entire State have been reported in this manner, a statistical report for the State as a whole will be issued, presenting the findings of the Forest Survey on growth and commodity drain as well as on forest area and timber volume. Later, a comprehensive report will be published; in this the current forest situation and prospective changes will be analyzed.

The Forest Survey is conducted in the various forest regions by the forest experiment stations of the Forest Service. The project in the Northeast is directed by the Northeastern Forest Experiment Station, with regional headquarters in Upper Darby, Pennsylvania.

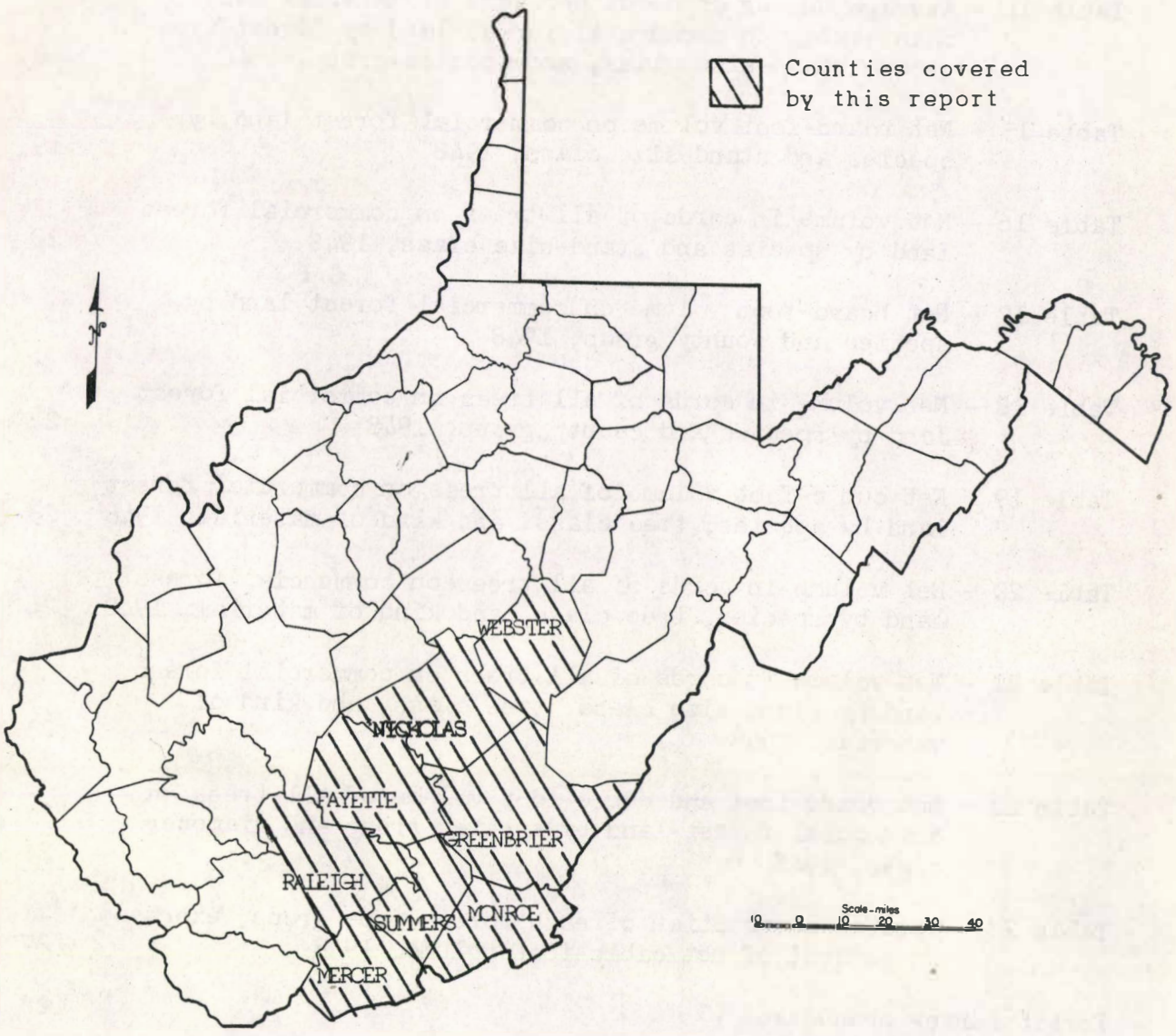
The Station thanks the many individuals and agencies in West Virginia who cooperated in facilitating the forest survey. Special appreciation is due the West Virginia Conservation Commission for making aerial photographs available and for collaborating through the assignment of personnel in a joint forest and game-habitat survey.

CONTENTS

CONTENTS (continued)

FOREST SURVEY IN WEST VIRGINIA

JUNE 1949



Northeastern Forest Experiment Station

FOREST STATISTICS FOR SOUTHEASTERN WEST VIRGINIA

compiled by

Forest Survey Staff
Northeastern Forest Experiment Station

SALIENT STATISTICS

The eight counties[1/] in the southeastern part of West Virginia covered by this report have a gross area of about 3 million acres. A series of high ridges (part of the Allegheny Mountains) lie along the eastern boundary near Virginia. Immediately west of these ridges, the land is rolling to hilly. Farther west the topography becomes increasingly mountainous especially in the four northwestern counties. These mountains are in the eastern fringe of the Cumberlands.

The average elevation in the area is 2,220 feet, but some mountains rise above 4,000 feet. Average precipitation is about 44 inches per year, slightly higher than that for the State as a whole. Tributaries of the Kanawha River drain 99 percent of the region; the remaining 1 percent is drained by the James River.

These eight counties occupy 20 percent of the area of West Virginia, but in 1940 they contained only 18 percent of the State's population. Of these 350,260 people, 54 percent were rural nonfarm residents (mostly miners), 30 percent were farmers, and 16 percent urban. Greenbrier, Monroe, and Webster Counties had no urban population. Beckley, in central Raleigh County, and Bluefield, in southern Mercer County at the Virginia border, are the only two cities in the area that have populations of more than 10,000.

Coal mining, including stripping, is the major industry. It is most prevalent in Fayette, Nicholas, and Webster Counties. Agriculture predominates in Monroe, Summers, and central and eastern Greenbrier Counties. The agricultural land in this eight-county area is largely devoted to grazing, but there is some general farming. The lumbering industry once supported a number of large, permanent sawmills. A few remain, notably in eastern Nicholas County. Many portable mills are scattered throughout the region; they cut some lumber, but mostly ties and mine props, caps and headers.

1/ Fayette, Greenbrier, Mercer, Monroe, Nicholas, Raleigh, Summers, and Webster Counties.

There are several metal alloy plants along the banks of the Kanawha River in western Fayette County. These represent the extreme eastern edge of the Charleston metropolitan area.

Numerous primary highways and a moderately extensive system of good secondary roads serve the region. The unpaved roads are fairly good, although their condition changes according to the weather. Five railroad systems serve all parts of the area. The Kanawha River carries barge traffic.

Forest land ownership.--This southeastern section of West Virginia has a gross land area of 3,032,300 acres, 73 percent of which is forested. The proportion of forest area per county ranges from 50 percent in Monroe to nearly 90 percent in Webster. Of the 2,214,100 acres of forest land, less than half of 1 percent is classified as noncommercial, i.e., reserved from cutting. About 8 percent of the commercial forest land lies within the Monongahela National Forest. Other publicly owned forest, including the Greenbrier State Forest, comprises 0.7 percent of the total. Twenty-three percent is in farm woodland while the remaining 68 percent is in other private ownership, chiefly large mining and lumber company holdings.

Forest type groups.--The forest types of this eight-county area have been combined into five type groups: oak-hickory, cove hardwood, northern hardwood, chestnut oak, and softwood.

A little more than one-third of the commercial forest land is in the oak-hickory types. The predominant type in this group is red oak; white oak is next in extent. Red oak is the predominant species, followed by white oak, hickory, chestnut oak, and red maple.

The cove hardwood type occupies 28 percent of the commercial forest area. It usually occurs on the deep, moist sites in the coves and extends up the lower slopes. The boundary between the cove hardwood type and the northern hardwood and oak-hickory types is seldom distinct. The latter types are generally located on the upper slopes and ridges above the coves. Species such as red oak, sugar maple, basswood, beech, and hickory are commonly found intermingled with yellow-poplar in the coves of this section.

The northern hardwood type, comprising 20 percent of the commercial forest, is the predominant forest type in Greenbrier, Nicholas, and Webster Counties. Beech, sugar maple, and yellow birch are the dominant species in this type, and red maple and basswood are the principal associates.

The chestnut oak type, forming 12 percent of the commercial forest area, straddles the dry, rocky ridges. Associated species are red oak and hickory.

The remaining 5 percent of the commercial forest land is in the softwood type group. The principal species in this group are hemlock, the yellow pines, white pine, white oak, and chestnut oak.

Site quality.--The productivity of a forest soil is variable. In order to compare the relative productivity of various sites arbitrary standards have been established. These are based on differences in tree height growth. At present, 15 percent of the commercial forest area is considered good site, capable of producing three or more 16-foot logs in hardwood trees and five or more in softwood; 78 percent is rated as fair site, capable of producing one and one-half to three logs in hardwood trees or three to five logs in softwood trees. The remainder is classified as poor site but is capable of producing trees having at least one 8-foot merchantable log.

Stand-size class.--Lumbering is the second most important industry in both the mining and agricultural sections. Nearly all of the forest land has been logged at least once and much of it is being culled over again for mine timbers.

Nearly 45 percent of the commercial forest land is in saw-timber stands of 1,500 board feet or more per acre. Pole-timber stands, at least 10 percent stocked with trees 5.0 inches or more in diameter, occupy 39 percent of the commercial forest area. The remaining 17 percent of the commercial forest land is made up of seedling and sapling stands, poorly stocked stands, and unstocked areas.

Live-tree volume in medium and heavy saw-timber stands (5,000 board feet per acre or more) averages 9,130 board feet plus 15 cords of smaller material; in light saw-timber stands (1,500 to 5,000 board feet per acre) the average is 3,170 board feet and 11 cords of smaller material. Pole-timber stands average 680 board feet per acre as well as 8 cords of smaller material.

Sawlog volume.--On all the commercial forest land there is a total of 5,878,700,000 board feet in live trees and 538,500,000 board feet of dead chestnut. Hardwoods account for 91 percent of the sawlog volume; red oak, beech, and sugar maple are the most extensively represented, followed by chestnut oak, yellow and black birch, yellow-poplar, hickory, and red maple. Nearly half of the softwood sawlog volume is in hemlock, more than one-fourth in white pine, and the remainder in the yellow pines and other conifers.

About one-third of the softwood sawlog volume is in trees 20 inches or more in diameter, while 44 percent of the hardwood volume is found in these larger diameters.

All sawlog volumes are net, deductions having been made for rot, crook, or other defects. Average cull in softwood sawlog material is 12 percent and in hardwood 19 percent.

Volume in cords.--The total net volume in all trees 5.0 inches or more in diameter is 33,524,000 cords. This represents an average of 25 cords per acre in saw-timber stands, 9 cords in pole-timber stands, and 2½ cords in seedling and sapling and poorly stocked stands. Of the total cordwood volume, 43 percent is found in sawlog material, 27 percent in pole-timber trees, 14 percent in upper stems and limbs of saw-timber trees, and 16 percent in the sound volume of cull trees.

Cubic-foot volume.--The total solid-wood content of all live trees 5.0 inches d.b.h. and larger is 2,204,100,000 cubic feet, or about 1,000 cubic feet per acre of commercial forest land.

Table 1.--Commercial and noncommercial forest area by county group, 1948

Kind of land	Fayette Raleigh	Green-brier	Mercer Monroe Summers	Nicholas Webster	Total	
	Acres	Acres	Acres	Acres	Acres	Percent
Forest:						
Commercial	634,200	465,600	466,100	635,900	2,201,800	72.6
Noncommercial:						
Reserved productive	3,700	400	100	8,100	12,300	0.4
Nonproductive	--	--	--	--	--	--
Total	3,700	400	100	8,100	12,300	0.4
Total forest	637,900	466,000	466,200	644,000	2,214,100	73.0
Nonforest	170,400	190,600	333,200	124,000	818,200	27.0
All land 1/	808,300	656,600	799,400	768,000	3,032,300	100.0

1/ From Areas of the United States, 1940, Bureau of the Census.

Table 2.--Forest and nonforest area by county, 1948

County	Forest area 1/		Nonforest area		Total land area
	Acres	Percent	Acres	Percent	Acres
Fayette	352,300	83.5	69,400	16.5	421,700
Greenbrier	466,000	71.0	190,600	29.0	656,600
Mercer	159,000	59.6	107,900	40.4	266,900
Monroe	153,000	50.5	149,700	49.5	302,700
Nicholas	329,000	79.2	86,400	20.8	415,400
Raleigh	285,600	73.9	101,000	26.1	386,600
Summers	154,200	67.1	75,600	32.9	229,800
Webster	315,000	89.3	37,600	10.7	352,600
Total	2,214,100	73.0	818,200	27.0	3,032,300

1/ Includes both commercial and noncommercial forest area.

Table 3.--Commercial forest area by ownership class and county group, 1948

Ownership class	Fayette Raleigh	Green-brier	Mercer Monroe Summers	Nicholas Webster	Total	
	Acres	Acres	Acres	Acres	Acres	Percent
Federal:						
National forest	--	95,900	--	85,200	181,100	8.3
Other	--	--	7,500	--	7,500	.3
Total Federal	--	95,900	7,500	85,200	188,600	8.6
State, county, and municipal	2,400	5,400	--	--	7,800	0.4
Private:						
Farm woodland[1/]	82,200	93,800	211,400	125,300	512,700	23.3
Other	549,600	270,500	247,200	425,400	1,492,700	67.7
Total private	631,800	364,300	458,600	550,700	2,005,400	91.0
All ownerships	634,200	465,600	466,100	635,900	2,201,800	100.0

1/ Census of Agriculture: 1945.

Table 4.--Commercial forest area by forest type and county group, 1948

Forest type	Fayette Raleigh	Green-brier	Mercer Monroe Summers	Nicholas Webster	Total	
	Acres	Acres	Acres	Acres	Acres	Percent
Softwood:						
White pine	3,600	--	4,800	--	8,400	0.4
Hemlock	19,500	7,000	--	6,000	32,500	1.4
Pitch and Virginia pine	--	7,100	17,400	3,800	28,300	1.3
Hard pine-oak	--	11,300	23,500	--	34,800	1.6
Spruce-hardwood	--	3,800	--	--	3,800	.2
Total	23,100	29,200	45,700	9,800	107,800	4.9
Northern hardwood:						
Aspen	--	--	5,100	--	5,100	0.2
Northern hardwood	54,400	139,800	13,300	230,000	437,500	19.9
Total	54,400	139,800	18,400	230,000	442,600	20.1
Cove hardwood	277,100	48,200	123,000	163,400	611,700	27.8
Chestnut oak:						
Scrub oak	--	4,700	--	--	4,700	0.2
Chestnut oak	68,700	68,000	57,100	64,300	258,100	11.7
Total	68,700	72,700	57,100	64,300	262,800	11.9
Oak-hickory:						
Hardwood-white pine	4,300	7,100	4,000	--	15,400	0.7
White oak	42,500	49,600	44,200	25,300	161,600	7.3
Red oak	164,100	119,000	173,700	143,100	599,900	27.3
Total	210,900	175,700	221,900	168,400	776,900	35.3
All types	634,200	465,600	466,100	635,900	2,201,800	100.0

Table 5.--Commercial forest area by county group, forest type group, and stand-size class, 1948

FAYETTE AND RALEIGH COUNTIES

Stand-size class	Forest type group					All forest types
	Softwood	Northern hardwood	Cove hardwood	Chestnut oak	Oak-hickory	
	Acres	Acres	Acres	Acres	Acres	Acres
Saw-timber stands:						
Medium and heavy	3,700	11,800	45,300	7,300	4,500	72,600
Light	8,800	21,700	56,000	30,400	74,100	191,000
Pole-timber stands	10,600	15,800	103,600	31,000	95,300	256,300
Seedling and sapling	--	5,100	44,800	--	21,700	71,600
Poorly stocked stands	--	--	27,400	--	15,300	42,700
All stands	23,100	54,400	277,100	68,700	210,900	634,200
GREENBRIER COUNTY						
Saw-timber stands:						
Medium and heavy	3,200	61,700	6,500	9,700	19,500	100,600
Light	3,300	29,900	23,200	23,400	36,600	116,400
Pole-timber stands	22,700	34,000	7,600	30,200	90,600	185,100
Seedling and sapling	--	14,200	--	9,400	23,600	47,200
Poorly stocked stands	--	--	10,900	--	5,400	16,300
All stands	29,200	139,800	48,200	72,700	175,700	465,600
MERCER, MONROE, AND SUMMERS COUNTIES						
Saw-timber stands:						
Medium and heavy	--	3,800	19,800	8,200	12,800	44,600
Light	14,100	5,200	45,400	10,000	23,400	98,100
Pole-timber stands	19,400	9,400	41,000	22,900	119,700	212,400
Seedling and sapling	5,300	--	5,900	11,300	57,200	79,700
Poorly stocked stands	6,900	--	10,900	4,700	8,800	31,300
All stands	45,700	18,400	123,000	57,100	221,900	466,100
NICHOLAS AND WEBSTER COUNTIES						
Saw-timber stands:						
Medium and heavy	3,000	87,100	27,000	3,000	15,000	135,100
Light	3,000	66,700	75,800	18,200	48,400	212,100
Pole-timber stands	3,800	61,800	34,200	31,600	65,000	196,400
Seedling and sapling	--	14,400	4,100	11,500	23,800	53,800
Poorly stocked stands	--	--	22,300	--	16,200	38,500
All stands	9,800	230,000	163,400	64,300	168,400	635,900

Table 6.--Commercial forest area by forest type group and stand-size class, 1948

Stand-size class	Forest type group					All forest types
	Softwood	Northern hardwood	Cove hardwood	Chestnut Oak	Oak-hickory	
	Acres	Acres	Acres	Acres	Acres	Acres
Saw-timber stands:						
Medium and heavy	9,900	164,400	98,600	28,200	51,800	352,900
Light	29,200	123,500	200,400	82,000	182,500	617,600
Pole-timber stands	56,500	121,000	186,400	115,700	370,600	850,200
Seedling and sapling	5,300	33,700	54,800	32,200	126,300	252,300
Poorly stocked stands	6,900	--	71,500	4,700	45,700	128,800
All stands	107,800	442,600	611,700	262,800	776,900	2,201,800

Table 7.--Commercial forest area by forest type group and site class, 1948

Forest type group	Site class			All sites
	Good	Fair	Poor	
	Acres	Acres	Acres	Acres
Softwood	10,300	76,600	20,900	107,800
Northern hardwood	94,900	343,000	4,700	442,600
Cove hardwood	154,700	449,600	7,400	611,700
Chestnut oak	--	206,500	56,300	262,800
Oak-hickory	77,300	642,800	56,800	776,900
All types	337,200	1,718,500	146,100	2,201,800
Percent	15.3	78.1	6.6	100.0

Table 8.--Commercial forest area by watershed and stand-size class, 1948

Stand-size class	Watershed		Total	
	James	Kanawha		
	Acres	Acres	Acres	Percent
Saw-timber stands:				
Medium and heavy	--	352,900	352,900	16.0
Light	5,100	612,500	617,600	28.1
Pole-timber stands	10,500	839,700	850,200	38.6
Seedling and sapling	10,800	241,500	252,300	11.5
Poorly stocked stands	--	128,800	128,800	5.8
All stands	26,400	2,175,400	2,201,800	100.0
Percent	1.2	98.8	100.0	--

Table 9.--Net board-foot volume on commercial forest land by forest type group, stand-size class, and species group, 1948

(Log scale, International 1/4-inch rule)

Stand-size class and species group	Forest type group					All forest types
	Softwood	Northern hardwood	Cove hardwood	Chestnut oak	Oak-hickory	
	M bd.ft.	M bd.ft.	M bd.ft.	M bd.ft.	M bd.ft.	M bd.ft.
Saw-timber stands:						
Medium and heavy						
Softwood	106,800	72,400	33,700	--	34,400	247,300
Hardwood	26,300	1,546,200	770,000	210,700	421,500	2,974,700
Total	133,100	1,618,600	803,700	210,700	455,900	3,222,000
Light						
Softwood	78,600	37,300	18,100	14,600	19,200	167,800
Hardwood	34,300	380,900	644,800	228,800	504,600	1,793,400
Total	112,900	418,200	662,900	243,400	523,800	1,961,200
Pole-timber stands						
Softwood	50,500	4,200	5,700	8,400	23,700	92,500
Hardwood	9,400	92,600	103,700	78,700	197,500	481,900
Total	59,900	96,800	109,400	87,100	221,200	574,400
Other stands 1/						
Softwood	1,300	--	6,500	1,200	2,500	11,500
Hardwood	--	9,600	59,600	25,300	15,100	109,600
Total	1,300	9,600	66,100	26,500	17,600	121,100
All stands						
Softwood	237,200	113,900	64,000	24,200	79,800	519,100
Hardwood	70,000	2,029,300	1,578,100	543,500	1,138,700	5,359,600
Total	307,200	2,143,200	1,642,100	567,700	1,218,500	5,878,700
Percent	5.2	36.5	27.9	9.7	20.7	100.0

1/ Includes seedling and sapling stands, poorly stocked stands, and unstocked areas.

Table 10.--Average net board-foot volume per acre on commercial forest land by forest type group, stand-size class, and species group, 1948

(Log scale, International 1/4-inch rule)

Stand-size class and species group	Forest type group					All forest types
	Softwood	Northern hardwood	Cove hardwood	Chestnut oak	Oak-hickory	
	Bd.ft.	Bd.ft.	Bd.ft.	Bd.ft.	Bd.ft.	Bd.ft.
Saw-timber stands:						
Medium and heavy						
Softwood	10,780	440	340	--	660	700
Hardwood	2,660	9,400	7,810	7,470	8,140	8,430
Total	13,440	9,840	8,150	7,470	8,800	9,130
Light						
Softwood	2,690	300	90	180	100	270
Hardwood	1,180	3,090	3,220	2,790	2,770	2,900
Total	3,870	3,390	3,310	2,970	2,870	3,170
Pole-timber stands						
Softwood	890	30	30	70	60	110
Hardwood	170	770	560	680	540	570
Total	1,060	800	590	750	600	680
Other stands						
Softwood	110	--	50	30	10	30
Hardwood	--	280	470	690	90	290
Total	110	280	520	720	100	320
All stands						
Softwood	2,200	260	100	90	100	240
Hardwood	650	4,580	2,580	2,070	1,470	2,430
Total	2,850	4,840	2,680	2,160	1,570	2,670

Table 11.--Net volume in cords of sawlog material on commercial forest land by forest type group, stand-size class, and species group, 1948

(Standard cords, including bark)

Stand-size class and species group	Forest type group					All forest types
	Softwood	Northern hardwood	Cove hardwood	Chestnut oak	Oak-hickory	
	M cords	M cords	M cords	M cords	M cords	M cords
Saw-timber stands:						
Medium and heavy						
Softwood	249	160	76	--	66	551
Hardwood	64	3,729	1,838	527	1,017	7,175
Total	313	3,889	1,914	527	1,083	7,726
Light						
Softwood	178	88	42	36	47	391
Hardwood	84	954	1,580	591	1,248	4,457
Total	262	1,042	1,622	627	1,295	4,848
Pole-timber stands						
Softwood	116	10	14	21	57	218
Hardwood	24	241	262	202	497	1,226
Total	140	251	276	223	554	1,444
Other stands						
Softwood	4	--	16	2	7	29
Hardwood	-	23	152	62	37	274
Total	4	23	168	64	44	303
All stands						
Softwood	547	258	148	59	177	1,189
Hardwood	172	4,947	3,832	1,382	2,799	13,132
Total	719	5,205	3,980	1,441	2,976	14,321
Percent	5.0	36.3	27.8	10.1	20.8	100.0

Table 12.--Average number of cords per acre of sawlog material on commercial forest land by forest type group, stand-size class, and species group, 1948

(Standard cords, including bark)

Stand-size class and species group	Forest type group					All forest types
	Softwood	Northern hardwood	Cove hardwood	Chestnut oak	Oak-hickory	
	Cords	Cords	Cords	Cords	Cords	Cords
Saw-timber stands:						
Medium and heavy						
Softwood	25.1	1.0	0.8	--	1.3	1.6
Hardwood	6.5	22.7	18.6	18.7	19.6	20.3
Total	31.6	23.7	19.4	18.7	20.9	21.9
Light						
Softwood	6.1	0.7	0.2	0.4	0.3	0.6
Hardwood	2.9	7.7	7.9	7.2	6.8	7.2
Total	9.0	8.4	8.1	7.6	7.1	7.8
Pole-timber stands						
Softwood	2.1	0.1	0.1	0.2	0.2	0.3
Hardwood	.4	2.0	1.4	1.7	1.3	1.4
Total	2.5	2.1	1.5	1.9	1.5	1.7
Other stands						
Softwood	0.3	--	0.1	--	--	0.1
Hardwood	--	0.7	1.2	1.7	0.2	.7
Total	0.3	0.7	1.3	1.7	0.2	0.8
All stands						
Softwood	5.1	0.6	0.2	0.2	0.2	0.5
Hardwood	1.6	11.1	6.3	5.3	3.6	6.0
Total	6.7	11.7	6.5	5.5	3.8	6.5

Table 13.--Net volume in cords of material other than sawlog on commercial forest land by forest type group, stand-size class, and species group, 1948

(Standard cords, including bark)

Stand-size class and species group	Forest type group					All forest types
	Softwood	Northern hardwood	Cove hardwood	Chestnut oak	Oak-hickory	
	M cords	M cords	M cords	M cords	M cords	M cords
Saw-timber stands:						
Medium and heavy						
Softwood	79	40	17	--	7	143
Hardwood	84	2,733	1,267	445	591	5,120
Total	163	2,773	1,284	445	598	5,263
Light						
Softwood	118	41	17	12	18	206
Hardwood	126	1,686	2,221	966	1,513	6,512
Total	244	1,727	2,238	978	1,531	6,718
Pole-timber stands						
Softwood	264	18	9	9	50	350
Hardwood	182	1,053	1,558	885	2,529	6,207
Total	446	1,071	1,567	894	2,579	6,557
Other stands						
Softwood	13	--	12	1	9	35
Hardwood	9	89	230	134	168	630
Total	22	89	242	135	177	665
All stands						
Softwood	474	99	55	22	84	734
Hardwood	401	5,561	5,276	2,430	4,801	18,469
Total	875	5,660	5,331	2,452	4,885	19,203
Percent	4.5	29.5	27.8	12.8	25.4	100.0

Table 14.--Average number of cords per acre of material other than sawlog on commercial forest land by forest type group, stand-size class, and species group, 1948

(Standard cords, including bark)

Stand-size class and species group	Forest type group					All forest types
	Softwood	Northern hardwood	Cove hardwood	Chestnut oak	Oak-hickory	
	Cords	Cords	Cords	Cords	Cords	Cords
Saw-timber stands:						
Medium and heavy						
Softwood	8.0	0.2	0.2	--	0.1	0.4
Hardwood	8.5	16.6	12.8	15.8	11.4	14.5
Total	16.5	16.8	13.0	15.8	11.5	14.9
Light						
Softwood	4.0	0.3	0.1	0.1	0.1	0.3
Hardwood	4.3	13.7	11.1	11.8	8.3	10.5
Total	8.3	14.0	11.2	11.9	8.4	10.8
Pole-timber stands						
Softwood	4.7	0.1	--	0.1	0.1	0.4
Hardwood	3.2	8.7	8.4	7.6	6.8	7.3
Total	7.9	8.8	8.4	7.7	6.9	7.7
Other stands						
Softwood	1.1	--	0.1	--	0.1	0.1
Hardwood	.7	2.6	1.8	3.6	1.0	1.6
Total	1.8	2.6	1.9	3.6	1.1	1.7
All stands						
Softwood	4.4	0.2	0.1	0.1	0.1	0.3
Hardwood	3.7	12.6	8.6	9.2	6.2	8.4
Total	8.1	12.8	8.7	9.3	6.3	8.7

Table 15.--Net board-foot volume on commercial forest land by species and stand-size class, 1948

(Log scale, International 1/4-inch rule)

Species	Saw-timber stands	Pole-timber stands	Other stands	Total	
	M bd.ft.	M bd.ft.	M bd.ft.	M bd.ft.	Percent
Softwoods:					
Hemlock	219,000	20,400	6,500	245,900	4.2
White pine	120,700	24,100	--	144,800	2.5
Yellow pine	38,600	46,900	5,000	90,500	1.5
Other softwoods	36,800	1,100	--	37,900	.6
All softwoods	415,100	92,500	11,500	519,100	8.8
Hardwoods:					
Sugar maple	552,800	6,500	2,500	561,800	9.6
Red maple	275,800	28,200	11,400	315,400	5.4
Red oak	798,800	148,700	19,900	967,400	16.5
White oak	217,900	35,400	9,500	262,800	4.5
Chestnut oak	420,700	69,300	19,000	509,000	8.7
Yellow birch	449,100	6,100	--	455,200	7.7
Beech	652,500	40,500	15,700	708,700	12.0
Ash	70,100	5,100	--	75,200	1.3
Basswood	249,000	23,000	--	272,000	4.6
Black cherry	37,400	6,900	2,300	46,600	.8
Yellow-poplar	383,800	21,400	--	405,200	6.9
Cucumber	117,300	10,600	7,300	135,200	2.3
Hickory	332,200	32,600	800	365,600	6.2
Gum	112,000	27,700	9,400	149,100	2.5
Other hardwoods	98,700	19,900	11,800	1/ 130,400	2.2
All hardwoods	4,768,100	481,900	109,600	5,359,600	91.2
All species 2/	5,183,200	574,400	121,100	5,878,700	100.0
Percent	88.2	9.8	2.0	100.0	--

1/ Includes 25,700,000 board feet of so-called nonmerchantable species such as sourwood, sassafras, and hophornbeam.

2/ In addition there are 538,500,000 board feet of dead chestnut: 347,300,000 in saw-timber stands, 165,900,000 in pole-timber stands, and 25,300,000 in poorly stocked stands and denuded areas.

Table 16.—Net volume in cords of all trees on commercial forest land by species and stand-size class, 1948

(Standard cords, including bark)

Species	Saw-timber stands	Pole-timber stands	Other stands	Total	
	M cords	M cords	M cords	M cords	Percent
Softwoods:					
Hemlock	685	139	28	852	2.5
White pine	325	154	--	479	1.4
Yellow pine	145	254	33	432	1.3
Other softwoods	136	21	3	160	.5
All softwoods	1,291	568	64	1,923	5.7
Hardwoods:					
Sugar maple	2,533	329	26	2,888	8.6
Red maple	1,672	441	76	2,189	6.5
Red oak	3,277	1,493	130	4,900	14.7
White oak	1,016	733	71	1,820	5.4
Chestnut oak	2,290	986	174	3,450	10.3
Yellow birch	1,859	217	19	2,095	6.2
Beech	3,264	697	90	4,051	12.1
Ash	371	111	--	482	1.4
Basswood	1,352	221	6	1,579	4.7
Black cherry	168	80	7	255	.8
Yellow-poplar	1,678	478	58	2,214	6.6
Cucumber	379	52	27	458	1.4
Hickory	1,506	562	36	2,104	6.3
Gum	559	231	57	847	2.5
Other hardwoods	1,340	802	127	1/ 2,269	6.8
All hardwoods	23,264	7,433	904	31,601	94.3
All species 2/	24,555	8,001	968	33,524	100.0
Percent	73.2	23.9	2.9	100.0	--

1/ Includes 53,000 cords of so-called nonmerchantable species such as sourwood, sassafras, hophornbeam, and serviceberry.

2/ In addition there are 262,000 cords of dead chestnut: 155,000 in saw-timber stands, 95,000 in pole-timber stands, and 12,000 in poorly stocked stands and denuded areas.

Table 17.--Net board-foot volume on commercial forest land by species and county group, 1948

(Log scale, International 1/4-inch rule)

Species	Fayette Raleigh	Greenbrier	Mercer Monroe Summers	Nicholas Webster	Total
	M bd.ft.	M bd.ft.	M bd.ft.	M bd.ft.	M bd.ft.
Softwoods:					
Hemlock	107,200	63,900	5,500	69,300	245,900
White pine	70,300	56,600	17,900	--	144,800
Yellow pine	--	55,100	34,900	500	90,500
Other softwoods	--	31,300	--	6,600	37,900
All softwoods	177,500	206,900	58,300	76,400	519,100
Hardwoods:					
Sugar maple	69,800	159,100	26,300	306,600	561,800
Red maple	55,500	128,600	17,900	113,400	315,400
Red oak	235,200	190,900	198,600	342,700	967,400
White oak	30,900	113,700	53,500	64,700	262,800
Chestnut oak	205,300	97,800	38,600	167,300	509,000
Yellow birch	29,600	180,800	6,000	238,800	455,200
Beech	72,500	210,300	12,100	413,800	708,700
Ash	7,900	39,800	13,600	13,900	75,200
Basswood	115,200	53,900	23,600	79,300	272,000
Black cherry	5,600	29,400	1,800	9,800	46,600
Yellow-poplar	115,300	80,400	17,100	192,400	405,200
Cucumber	38,000	13,900	17,600	65,700	135,200
Hickory	83,600	71,000	81,600	129,400	365,600
Gum	45,400	7,700	13,800	82,200	149,100
Other hardwoods	37,800	36,100	22,300	34,200	130,400
All hardwoods	1,147,600	1,413,400	544,400	2,254,200	5,359,600
All species[1/]	1,325,100	1,620,300	602,700	2,330,600	5,878,700
Percent	22.5	27.6	10.3	39.6	100.0

1/ In addition, there are 99,300,000 board feet of dead chestnut in Fayette and Raleigh Counties, 138,400,000 board feet in Greenbrier County, 34,600,000 board feet in Mercer, Monroe, and Summers Counties, and 266,200,000 board feet in Nicholas and Webster Counties.

Table 18.--Net volume in cords of all trees on commercial forest land by species and county group, 1948

(Standard cords, including bark)

Species	Fayette Raleigh	Greenbrier	Mercer Monroe Summers	Nicholas Webster	Total
	M cords	M cords	M cords	M cords	M cords
Softwoods:					
Hemlock	372	196	19	265	852
White pine	205	147	127	--	479
Yellow pine	2	229	181	20	432
Other softwoods	--	132	--	28	160
All softwoods	579	704	327	313	1,923
Hardwoods:					
Sugar maple	445	744	250	1,449	2,888
Red maple	429	732	208	820	2,189
Red oak	1,249	1,080	1,017	1,554	4,900
White oak	312	630	472	406	1,820
Chestnut oak	1,082	926	420	1,022	3,450
Yellow birch	180	845	65	1,005	2,095
Beech	626	1,245	89	2,091	4,051
Ash	73	214	81	114	482
Basswood	601	326	193	459	1,579
Black cherry	21	144	7	83	255
Yellow-poplar	752	293	122	1,047	2,214
Cucumber	137	60	52	209	458
Hickory	561	488	472	583	2,104
Gum	248	91	92	416	847
Other hardwoods	532	525	372	840	2,269
All hardwoods	7,248	8,343	3,912	12,098	31,601
All species[1/]	7,827	9,047	4,239	12,411	33,524
Percent	23.3	27.0	12.6	37.1	100.0

1/ In addition, there are 482,000 cords of dead chestnut in Fayette and Raleigh Counties, 720,000 cords in Greenbrier County, 241,000 cords in Mercer, Monroe, and Summers Counties, and 1,177,000 cords in Nicholas and Webster Counties.

Table 19.--Net cubic-foot volume of all trees on commercial forest land by species, tree class, and kind of material, 1948

(Excluding bark)

Species	Saw-timber trees		Pole-timber trees	Cull trees	Total
	Sawlog material	Upper stems and limbs			
	M cu.ft.	M cu.ft.	M cu.ft.	M cu.ft.	M cu.ft.
Softwoods:					
Hemlock	43,900	8,000	10,000	4,600	66,500
White pine	25,300	4,000	7,900	100	37,300
Yellow pine	16,700	3,400	12,200	1,400	33,700
Other softwoods	6,900	1,300	4,000	300	12,500
All softwoods	92,800	16,700	34,100	6,400	150,000
Hardwoods:					
Sugar maple	86,200	27,100	39,000	35,400	187,700
Red maple	50,200	16,700	38,000	37,400	142,300
Red oak	152,300	48,300	88,800	29,100	318,500
White oak	42,700	16,000	42,800	16,800	118,300
Chestnut oak	85,900	34,100	54,900	49,400	224,300
Yellow birch	68,100	23,200	26,800	18,000	136,100
Beech	113,400	35,100	40,800	74,000	263,300
Ash	12,000	4,300	9,300	5,800	31,400
Basswood	47,100	15,300	23,800	16,400	102,600
Black cherry	8,400	3,200	4,300	700	16,600
Yellow-poplar	64,100	18,900	54,000	6,900	143,900
Cucumber	21,100	5,700	200	2,700	29,700
Hickory	56,600	18,700	49,000	12,500	136,800
Gum	23,900	8,600	7,600	14,900	55,000
Other hardwoods	21,600	9,400	88,600	28,000	1/ 147,600
All hardwoods 2/	853,600	284,600	567,900	348,000	2,054,100
All species	946,400	301,300	602,000	354,400	2,204,100
Percent	42.9	13.7	27.3	16.1	100.0

1/ Includes 41,000,000 cubic feet of so-called nonmerchantable species such as sourwood, sassafras, hophornbeam, and serviceberry.

2/ In addition, there are 170,300,000 cubic feet of dead chestnut: 120,000,000 cubic feet in saw-timber trees and 50,300,000 cubic feet in pole-timber trees.

Table 20.--Net volume in cords of all trees on commercial forest land by species, tree class, and kind of material, 1948

(Standard cords, including bark)

Species	Saw-timber trees		Pole-timber trees	Cull trees	Total
	Sawlog material	Upper stems and limbs			
	M cords	M cords	M cords	M cords	M cords
Softwoods:					
Hemlock	563	101	129	59	852
White pine	324	52	102	1	479
Yellow pine	213	43	157	19	432
Other softwoods	89	18	50	3	160
All softwoods	1,189	214	438	82	1,923
Hardwoods:					
Sugar maple	1,326	416	601	545	2,888
Red maple	772	257	584	576	2,189
Red oak	2,343	743	1,366	448	4,900
White oak	657	246	659	258	1,820
Chestnut oak	1,322	524	845	759	3,450
Yellow birch	1,048	358	413	276	2,095
Beech	1,745	540	628	1,138	4,051
Ash	184	66	142	90	482
Basswood	725	235	366	253	1,579
Black cherry	129	48	67	11	255
Yellow-poplar	987	290	831	106	2,214
Cucumber	325	88	3	42	458
Hickory	871	288	753	192	2,104
Gum	367	133	118	229	847
Other hardwoods	331	146	1,361	431	2,269
All hardwoods	13,132	4,378	8,737	5,354	31,601
All species	14,321	4,592	9,175	5,436	33,524
Percent	42.7	13.7	27.4	16.2	100.0

Table 21.--Net volume in cords of all trees on commercial forest land by stand-size class, tree class, and kind of material, 1948

(Standard cords, including bark)

Stand-size class	Saw-timber trees		Pole-timber trees	Cull trees	Total
	Sawlog material	Upper stems and limbs			
	M cords	M cords	M cords	M cords	M cords
Saw-timber stands:					
Medium and heavy	7,726	2,206	1,558	1,499	12,989
Light	4,848	1,688	3,031	1,999	11,566
Pole-timber stands	1,444	594	4,223	1,740	8,001
Other stands	303	104	363	198	968
All stands	14,321	4,592	9,175	5,436	33,524

Table 22.--Net board-foot and cubic-foot volume of all trees on commercial forest land by species group and diameter class, 1948

SOFTWOODS

Diameter class (inches)	Sawlog material (log scale, Int. 1/4-inch rule)		All material (excluding bark)	
	M bd.ft.	Percent	M cu.ft.	Percent
6	--	--	13,700	9.1
8	--	--	21,000	14.0
10	55,600	10.7	16,600	11.1
12	77,800	15.0	17,600	11.7
14	59,600	11.5	12,800	8.5
16	60,000	11.6	13,200	8.8
18	89,200	17.2	17,600	11.7
20	31,100	6.0	7,500	5.0
22	60,200	11.6	11,800	7.9
24	11,400	2.2	2,200	1.5
26	59,000	11.3	10,900	7.3
28	15,200	2.9	2,900	1.9
30 and over	--	--	2,200	1.5
All softwoods	519,100	100.0	150,000	100.0
HARDWOODS				
6	--	--	196,000	9.5
8	--	--	221,700	10.8
10	--	--	208,800	10.1
12	663,000	12.4	190,500	9.3
14	783,400	14.6	205,100	10.0
16	789,000	14.7	203,300	10.0
18	787,800	14.7	194,300	9.4
20	601,600	11.2	153,800	7.5
22	546,300	10.2	135,800	6.6
24	366,000	6.8	100,000	4.9
26	292,600	5.5	85,200	4.1
28	304,900	5.7	84,100	4.1
30 and over	225,000	4.2	75,500	3.7
All hardwoods	5,359,600	100.0	2,054,100	100.0
All species	5,878,700	--	2,204,100	--

Table 23.--Species composition of each forest type group, expressed in percent of net cubic-foot volume, 1948

Species	Forest type group				
	Softwood	Northern hardwood	Cove hardwood	Chestnut oak	Oak-hickory
	Percent	Percent	Percent	Percent	Percent
Softwoods:					
Hemlock	27.7	2.7	2.5	--	--
White pine	16.6	.1	.1	0.4	3.0
Yellow pine	19.5	.1	--	2.1	.9
Other softwoods	4.3	1.0	--	--	.1
All softwoods	68.1	3.9	2.6	2.5	4.0
Hardwoods:					
Sugar maple	0.4	16.7	9.4	0.7	2.0
Red maple	4.3	9.7	6.2	1.7	5.0
Red oak	4.9	4.3	11.4	16.0	33.5
White oak	6.8	.8	2.9	3.2	15.3
Chestnut oak	5.5	1.3	3.9	54.6	8.9
Yellow birch	4.2	15.0	2.4	1.9	1.0
Beech	.1	27.8	8.5	.2	2.7
Ash	.1	1.5	2.6	.5	.7
Basswood	--	6.4	8.8	.1	.6
Black cherry	--	1.9	.3	--	.2
Yellow-poplar	--	2.7	17.8	.7	2.9
Cucumber	.5	.9	2.9	.1	.9
Hickory	2.0	1.4	8.3	7.9	10.6
Gum	.8	1.3	1.9	3.6	4.7
Other hardwoods	2.3	4.4	10.1	6.3	7.0
All hardwoods	31.9	96.1	97.4	97.5	96.0
All species	100.0	100.0	100.0	100.0	100.0

FOREST SURVEY PROCEDURE

These estimates of forest area and timber volume are based upon date obtained from a sampling of the eight counties. The following procedure was used:

Photo interpretation.--A large number of plots (about one to every 694 acres) were distributed regularly over the aerial photographs covering these counties. Photo interpreters first determined whether each plot was forest or nonforest. If forest, the stand in which the plot was located was examined by stereoscope and classified as to forest type and stand-size class (based on stand volume and density).

Ground plot examination.--The next step was to examine on the ground enough 1/5-acre forest plots randomly selected from those previously examined on aerial photos in order to establish a reliable average volume per acre from a tally of trees by species and diameters at breast height. Estimates of cull, site quality, past use, and other items also were recorded from the ground plots. An average of about one ground plot was selected to every 4,003 acres of forest land.

Compilation of data.--Photo-interpretation and field-plot data were entered on punch cards in the Upper Darby office. Tabulations were made from these data, resulting in the set of tables herewith.

ACCURACY OF DATA

The number of observations taken on the aerial photographs and the number of ground plots examined in each stand-size class were designed to yield forest-area and volume estimates of the highest practicable degree of sampling accuracy for the personnel and equipment available. Some errors in the forest inventory are inescapable because: (1) area classifications may be imperfect and volume of sample trees is derived from measurements of diameter, height, and form with adjustments for estimated defect; and (2) the estimated total is obtained by "blowing up" a sample.

Errors of the first class include mistakes in measurement and judgment, imperfect volume tables, and possible faulty adjustment for defects. Every effort was made to keep such errors to a minimum and compensating, but the degree to which this may have been attained cannot be measured satisfactorily. Errors of the second class are due to failure of the sample to perfectly represent the whole. Such errors

are measurable. The sampling errors for principal items for these counties as a whole are expressed below as percentages of their respective totals:

	Percent
Forest area	± 1.2
Saw-timber area	± 4.1
Pole-timber area	± 5.3
Total board-foot volume	± 4.8
Board-foot volume in saw-timber stands	± 5.8
Total cubic-foot volume	± 4.9
Cubic-foot volume in pole-timber stands	± 6.4

If no bias and no systematic errors are assumed, it is reasonable to expect that actual areas and volumes will be within the indicated range of reported areas and volumes about two times in three, and within the range of two sampling errors about 19 times in 20. For example, the chances are about two out of three that the forest area would not differ more than 1.2 percent from that reported herein. The chances are about 19 in 20 that the forest area would not differ more than 2.4 percent or twice that for one sampling error. Corresponding statements may be made for each of the other items for which sampling errors are given.

Statistics of forest area by type, stand-size class, etc., reported in the tables herewith are subject to increasing sampling error as the class becomes finer and its numerical magnitude smaller. In general, experience to date indicates the ranges in area sampling error shown below:

Class area in acres	Approximate area sampling error in percent
Less than 50,000:	Variable, usually over 40
50,000 to 100,000:	Ordinarily between 20 and 40
100,000 to 300,000:	Usually between 10 and 20
More than 300,000:	Commonly less than 10, but may be as high as 20

Volume sampling errors are larger (in percentage) than area errors and have a tendency to vary by stand-size class. Sampling errors of

board-foot data are usually larger than corresponding errors in cubic feet. The percentage additions that should generally be made to area sampling errors in order to estimate volume sampling errors are shown below:

Stand-size class	Volume sampling errors in relation to area sampling errors	
	For board feet	For cubic feet
	Percent	Percent
Saw timber:		
Medium and heavy	Add 1	Add 1
Light	Add 2	Add 1
Pole timber	Add 6 to 10	Add 2 to 3

Board-foot and cubic-foot volumes per acre are extremely variable for seedling and sapling and poorly stocked stands. The volume sampling errors for these stand-size classes are erratic and may be from 25 to 100 percent higher than the area sampling errors.

EXPLANATION OF TERMS USED

AREA

Land area.--Includes dry land and land temporarily or partially covered by water, such as marsh land, swamps, and river flood plains, streams, sloughs, estuaries, and canals less than one-eighth of a statute mile in width; and lakes, reservoirs, and ponds having less than 40 acres of area. (See "Areas of the United States, 1940," U.S. Bureau of the Census, page 2.) Does not include water areas larger than those defined above nor deeply indented embayments and sounds and other coastal water behind or sheltered by headlands or islands separated by less than 1 nautical mile of water; and islands having less than 40 acres of area.

Forest area.--Land bearing forest growth or land from which the forest has been removed but which shows evidence of past forest occupancy and which is not now in other use. Except for right of ways of active power lines, highways, roads, and railroads that are not abandoned, strips of nonforest land less than 100 feet wide and areas of less than 1 acre surrounded by forest were classified as forest.

Commercial forest area.--Forest land bearing or capable of bearing pole-timber or saw-timber stands of commercial character and economically available now or prospectively for commercial use and not formally withdrawn from such use.

Noncommercial forest area.--Two classes of forest land are included: (1) reserved productive--forest land bearing or capable of bearing pole-timber or saw-timber stands of commercial character but formally withdrawn from commercial use for parks, preserves, wilderness areas, and so forth; and (2) nonproductive--other forest land permanently incapable of producing commercial pole-timber or saw-timber stands. The latter areas are either rocky, mountainous, or do not possess the climate and soil qualities essential for the production of commercial timber crops.

Nonforest area.--All land areas other than forest, including the acreage in cultivation and pasture less than 30 percent covered by tree canopy; land enclosed within the right of ways of active power lines, highways, roads, and railroads; abandoned roads when the soil has been removed or the pavement remains; marshes, bare rock, quarries, coal strippings, and gravel pits; water areas such as lakes, reservoirs, and ponds having less than 40 acres of area, and streams, sloughs, estuaries, and canals less than one-eighth mile in width (larger water areas are classified as "inland water" by the Bureau of the Census and are not included within land area figures); and urban and other residential and industrial areas. Narrow belts of trees such as fence rows and stream margins less than 100 feet in width and small groups of trees less than one acre in area that are surrounded by nonforest land are considered nonforest.

FOREST TYPE GROUPS

(Board-foot volume of each species in saw-timber stands and number of stems in other stand-size classes was the basis for forest type classifications. Table 4 shows the detailed forest types that are combined in each forest type group. Table 23 gives the species composition of each forest type group, expressed in percent of net cubic-foot volume.)

Softwood.--Five types are included in this group: hard pine-oak, in which Virginia and pitch pines comprise 20-74 percent of the stand in mixture with various oaks; hemlock, in which hemlock is pure or predominant over any other species; pitch and Virginia pine, singly or in mixture these pines forming 75 percent or more of the stand in association with oak and hickory; white pine, this species making up 75 percent or more of the stand; and spruce-hardwood, spruce comprising 50-74 percent of the stand in mixture with hardwoods.

Cove hardwood.--A mixture of hardwoods usually found on the deep, moist sites of the coves and along lower slopes. Yellow-poplar usually occupies a prominent position in these stands and is variously combined with red oak, sugar maple, basswood, beech, and hickory.

Northern hardwood.--The northern hardwood type, made up largely of beech, sugar maple, and yellow birch associated chiefly with red maple and basswood, is the principal one in this group. A small acreage of aspen type is also included.

Chestnut oak.--The main type of this group is the chestnut oak in which this species predominates, associated with red oak and hickory. A relatively small area of scrub oak type is also included.

Oak-hickory.--Stands in which red or white oak predominates, usually in combination with hickory, chestnut oak, and red maple. Included also is a small area of hardwood-white pine type comprised chiefly of red and white oak and white pine.

STAND-SIZE CLASSES

(The minimum area classified according to stand-size was 1 acre.)

Medium and heavy saw-timber stands.--Stands that had a net volume of 5,000 board feet or more per acre.

Light saw-timber stands.--Stands that had a net volume of 1,500 to 4,999 board feet per acre.

Pole-timber stands.--Stands that had a net volume of less than 1,500 board feet per acre and at least 10 percent of the area covered by the crown canopy of pole-timber or larger trees. At least one-half the minimum stocking was in pole-timber trees. These stands generally contained at least 200 cubic feet per acre in trees 5.0 inches d.b.h. and larger.

Seedling and sapling stands.--Stands that did not qualify either as saw timber or pole timber but were well stocked with seedlings and saplings (at least 40 percent of the stand area covered by crown canopy). These stands generally contained at least 300 seedlings and saplings 1.0 to 4.9 inches d.b.h. per acre.

Poorly stocked stands.--Stands that did not qualify as saw timber or pole timber but were at least 10 percent stocked with saw-timber or pole-timber trees or with 10 to 39 percent of the crown canopy in seedlings and saplings.

Unstocked areas.--Stands that did not qualify as saw timber, pole timber, or seedling and sapling and were less than 10 percent stocked.

SITE CLASS

Site class.--Based on the average number of logs produced by mature trees in commercial forest areas. Where mature, dominant, or codominant trees were present, the following merchantable height classes based on 16-foot logs, were used:

Site	Hardwoods	Softwoods
Good	3 or more logs	5 or more logs
Fair	1½ to 3 logs	3 to 5 logs
Poor	8 feet to 1½ logs	8 feet to 3 logs
Nonproductive	(See definition under AREA)	

Where no mature trees of the dominant or codominant crown classes were present, site was estimated from the species and growth of immature trees, the depth and type of soil, aspect, soil moisture, and the shrubby and herbaceous ground cover. Poor sites that are incapable of producing pole-timber or saw-timber stands were classed as nonproductive (noncommercial forest area).

VOLUME ESTIMATES

(Volume in trees on areas classified as nonforest is not included; all volumes are net, that is, with defect deducted.)

Board-foot volume.--Includes the sawlog material in saw-timber trees estimated through use of the International 1/4-inch log rule, which closely approximates green lumber tally for square-edged boards. Merchantable heights for sawlogs were estimated to the point at which utilization is limited by large branches, forks, or deformities, or a d.i.b. of not less than 6 inches for softwoods and 8 inches for hardwoods. Deductions have been made for rot, crook, and other defects.

Cubic-foot volume.--Includes the sound wood, excluding bark, in: (1) the sawlog portion of saw-timber trees, (2) the upper stems of softwood saw-timber trees and the upper stems and limbs of hardwood saw-timber trees to a minimum of 4 inches inside bark, (3) the full stems of pole-timber trees to a minimum of 4 inches inside bark, and (4) the sound wood volume of cull trees. No deductions were made for defects unless they affected the wood structure.

Volume in cords.--This volume was derived from the net cubic-foot volume (excluding bark) by applying a factor of 78 cubic feet per cord for softwoods and 65 cubic feet per cord for hardwoods. Although the number of cubic feet per cord varies with the size of material, these converting factors were used for all material in this report. The resulting figures approximate the volume of a standard stacked cord (4 feet by 4 feet by 8 feet), including bark. No deductions were made for defect unless they affected the wood structure.

TREE CLASSES

Saw-timber tree.--A softwood tree at least 9.0 inches d.b.h. (diameter outside bark at 4½ feet above the ground on the upper side of the tree) or a hardwood tree at least 11.0 inches d.b.h. with a sound log at least 8 feet long and with at least half of the gross volume of the tree in merchantable material.

Pole-timber tree.--A tree that ranged from 5.0 inches d.b.h. up to the minimum saw-timber tree size and that gave promise of becoming a merchantable saw-timber tree.

Cull tree.--A tree that did not qualify as a saw-timber or pole-timber tree because of poor form, limbiness, rot, or other defect.

Tree-diameter class.--Each 2-inch diameter class included all trees measured in the range from 1.0 inch below the midpoint of the class up to but not including 1.0 inch above the midpoint. For example, the 6-inch class included all trees whose diameters fall in the range of 5.0 inches up to but not including 7.0 inches.

SPECIES

The various tree species found in this area are listed below. Approved common names 1/ are shown in parentheses if these differ from the brief name used in the tables. Approved scientific names 1/ are underlined. If two or more species are included under a single name in the tables, the various species are listed or the word "species" appears after the approved scientific name for the genus.

Softwoods

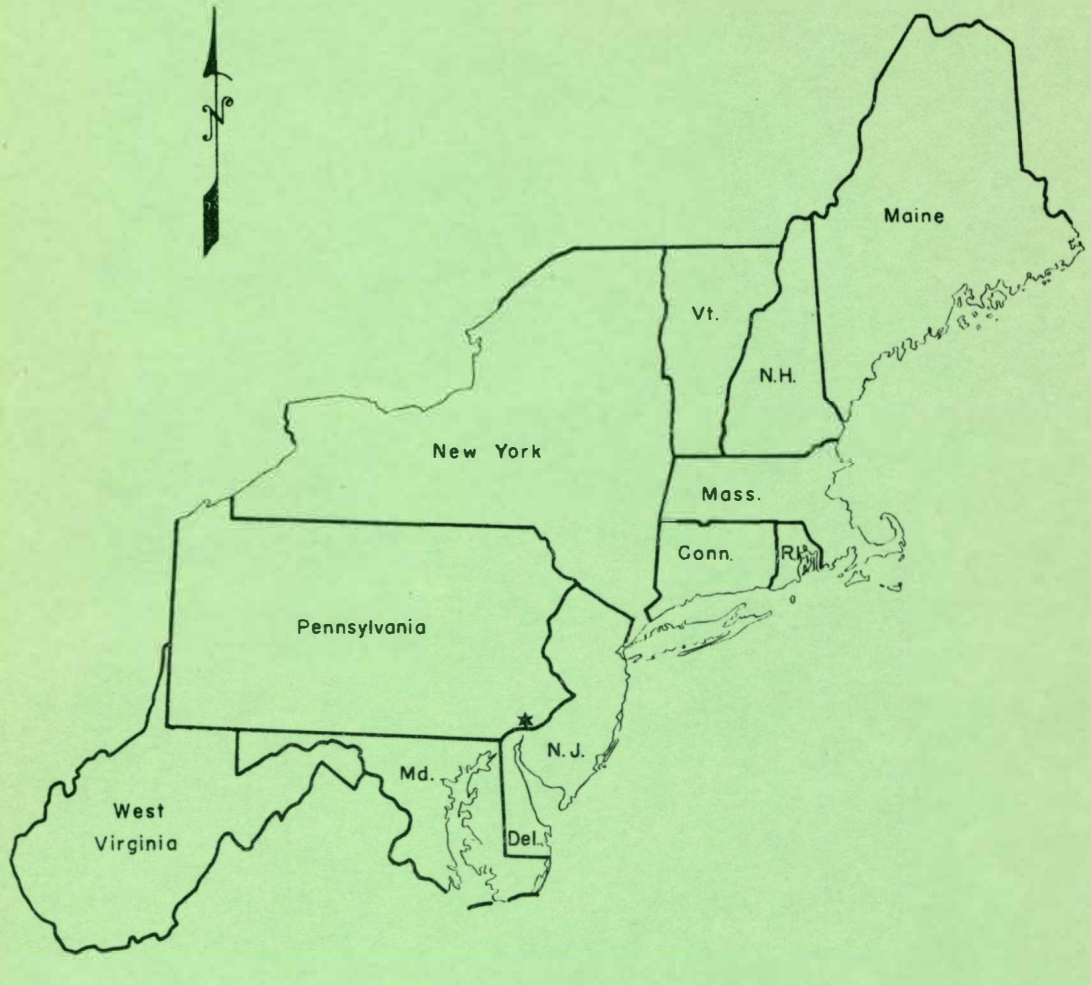
Hemlock (Eastern hemlock)	- Tsuga canadensis
White pine (Eastern white pine)	- Pinus strobus
Yellow pine (Pitch pine)	- Pinus rigida

1/ U. S. Forest Service. Check list of the native and naturalized trees of the United States, including Alaska. U. S. Dept. Agr. 325 pp.1944.

Yellow pine (Virginia pine)	- Pinus virginiana
Other softwoods (Table-mountain pine)	- Pinus pungens
(Loblolly pine)	- Pinus taeda
(Red spruce)	- Picea rubens

Hardwoods

Sugar maple	- Acer saccharophorum
Red maple	- Acer rubrum
Red oak (Northern red oak)	- Quercus borealis
(Black oak)	- Quercus velutina
(Scarlet oak)	- Quercus coccinea
White oak	- Quercus alba
Chestnut oak	- Quercus montana
Yellow birch (Yellow birch)	- Betula lutea
(Sweet birch)	- Betula lenta
Beech (American beech)	- Fagus grandifolia
Ash	- Fraxinus species
Basswood (American basswood)	- Tilia americana
Black cherry	- Prunus serotina
Yellow-poplar	- Liriodendron tulipifera
Cucumber (Cucumbertree)	- Magnolia acuminata
Hickory	- Carya species
Gum (Blackgum)	- Nyssa sylvatica
(Sweetgum)	- Liquidambar styraciflua
Other hardwoods (Yellow buckeye)	- Aesculus octandra
(Ohio buckeye)	- Aesculus glabra
(American elm)	- Ulmus americana
(Black walnut)	- Juglans nigra
(Butternut)	- Juglans cinerea
(Sassafras)	- Sassafras albidum
(Eastern hophornbeam)	- Ostrya virginiana
(Kentucky coffeetree)	- Gymnocladus dioicus
(Hackberry)	- Celtis occidentalis
(American sycamore)	- Platanus occidentalis
(Eastern redbud)	- Cercis canadensis
(Black locust)	- Robinia pseudoacacia
(Sourwood)	- Oxydendrum arboreum
(Downy serviceberry)	- Amelanchier arborea
(Pin cherry)	- Prunus pennsylvanica



TERRITORY SERVED
by the
NORTHEASTERN FOREST
EXPERIMENT STATION

UPPER DARBY, PA.